

## Symposium II. Prevention in Hypertension

### Hypertension: The Cardiovascular Risk Continuum

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#### Abstract

Hypertension is established modifiable risk factor for cardiovascular diseases (CVD) and should be considered a complex cardiovascular disorder and continues to be a topic of interest. Together with dyslipidemia, diabetes mellitus and cigarette smoking and all of them, along with nonmodifiable risk factors, age, gender and family history of CVD, have been incorporated into algorithm for risk assessment in the general population. Pathological sequence of events leading from risk factors to CVD is called The Cardiovascular continuum. CVD are the most important cause of death in the Western world and are responsible for a large proportion of the overall mortality and morbidity currently observed in the population of the developed countries. Atherosclerosis is the main cause of CVD and is the final result of a chain of events leading from risk factors to overt CV complications including catastrophic events such as stroke, myocardial infarction, or sudden death. A cumulative analysis of over 250,000 adults enrolled from 18 different cohort studies and followed up for three decades showed that the lifetime risk for developing a symptomatic CVD increased progressively over time in both sexes with a direct relationship with the individual number of CV risk factors and the extent of their control according to guidelines. This suggests the importance of a reliable assessment of the CV risk profile for a preventive strategy of CV complications. However, despite the advancement in the knowledge of the epidemiology and pathophysiology of atherosclerotic vascular disorders, the burden of CVD remains very high and is expected to increase progressively during the next 20 years. The main reasons are the progressive increase in the life span and the unsatisfactory control of CV risk factors in the general population at risk for CVD. For all these reasons, CVD prevention, that is, preventing or delaying clinical disease among asymptomatic and already exposed individuals, remains an issue of major public health interest. The overall incidence of CVD and its complications depend on the prevalence and clinical relevance of a series of major CV risk factors that are involved, directly or indirectly, in the development and progression of atherosclerotic disease. Most of these risk factors coexist in the same subject, and their cumulative effect is responsible for the development of CV complications. This implies that the overall estimation of the presence and relative weight of established risk factors is a mandatory strategy to identify the subjects at risk for CVD whom must be considered as the target of an aggressive CVD prevention. In practical terms, any effective approach to primary care or primary prevention of CVDs is built on the identification of multivariate models that can reasonably predict the absolute risk for future CV events in large segments of the population. However, these risk scores are a major advance over clinical risk prediction, and CVD prevention is certainly one of the few areas in clinical practice where such an approach is steadily included in practice guidelines. The concept of "total cardiovascular risk" has been recently developed as an estimate of the overall propensity of a subject to fall outside the boundaries of average CV risk based on the levels of different risk factors. Accordingly, most of the currently available risk scores have been developed in accordance with the notion of total CV risk, which actually represents the theoretical rationale behind any effective strategy of CV risk management. Hypertension is never born "resistant"; it can become resistant if treatment is initiated too late in the course of the continuum of cardiovascular disease. This continuum as an arch, the thickness of which progressively increases while the risk of cardiovascular events progressively increases by the development of asymptomatic organ damage first,

then the appearance of symptomatic disease, and finally the onset of cardiovascular events. Intervention trials indicate that antihypertensive treatment is capable of reducing outcomes by approximately 25%–30% independent of the risk level at which treatment is started. This finding has usually been translated into the concept that the absolute benefit of treatment is greater in high-risk patients, but the other corollary of this finding, namely, that the residual risk is also greater, has been ignored. The existence of a consistent residual risk in high-risk patients and the finding that some of these high-risk patients may be scarcely amenable to treatment benefits underline the limitations of late interventions and suggests that the recommendations by many private or public health-care providers, including the 2011 National Institute for Health and Clinical Excellence (NICE) in the United Kingdom, to limit interventions in patients with a total cardiovascular risk above 20% in 10 years may be unwise. The alternative recommendations may be “the earlier the better,” but then the challenge is in establishing when early is not too late but also not excessively early. A combined assessment of the number and interaction of CV risk factors is the concept that allows the definition of the “global CV risk.” Correct estimation of global CV risk is a crucial step for the identification of all the subjects where a preventive treatment is warranted including those with a borderline abnormality of several CV risk factors who would not have been otherwise treated according to a less comprehensive approach to CVD prevention focused on the identification and treatment of the prevalent risk factors. In conclusion, the available data suggest that clinicians who see the patients for the prevention of CVD should focus their practice on multivariate models that can predict, with reasonably reliability, the global risk of CV events in large segments of the population.